

inactions. Rather, their loss of status is a result of powerful externalities over which they have no power. Though YouTube is not an archive killer, and though archival material forms a mere fraction of the hundred million-plus YouTube videos, the site embodies a paradox: at the same time that it offers the greatest potential for the public dissemination of historical and cultural images and sounds, it threatens to make redundant the institutions that actively preserve these materials.

YouTube implicitly recognized that archives were not the end of the media lifecycle, but rather a new beginning. Corraling the labor of millions of users to curate, select and upload videos from every kind of source, YouTube gave new life to the moving-image heritage and exposed archival material to a vast audience. It is now up to archives to decide how best to fulfill their canonical missions in a changed world.

Endnotes

- 1 See <http://memory.loc.gov/ammem/index.html> [last checked 15 February 2009].
- 2 See www.archive.org/details/prelinger [last checked 15 February 2009]. Other moving-image collections available from the Internet Archive total approximately 160,000 items.
- 3 See <http://beerpla.net/2008/08/14/how-to-find-out-the-number-of-videos-on-youtube/> [last checked 15 February 2009]. The site estimates the total number of videos on YouTube between 141 and 144 million as of August 2008.
- 4 As of early 2009, YouTube has offered HD-quality (720p) playback in 16:9 format, provided that compatible videos have been uploaded.

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Navigating YouTube: Constituting a Hybrid Information Management System

“We no longer watch film or TV; we watch databases.” Geert Lovink uses this statement to address the shift emblemized by, among others, YouTube in the introduction to *The Video Vortex Reader*.¹ The so-called “database turn” that Lovink presents seems to him a fundamental shift in the way in which moving images are being experienced today. Talking about YouTube in terms of a database is without doubt an adequate description of the technological basis allowing users to upload, search, find and retrieve moving-image files on the site. This, however, is not the only conception users (or scholars) have of YouTube, and probably not the one that intuitively comes to mind, as the digital objects that one deals with are in fact perceived not as data sets, but rather as films, video clips, TV shows, etcetera—in other words: moving images. So before we continue our discussion of this platform’s function as a database, we will have a brief look at some other conceptualizations that try to consider YouTube in analogy to other cultural institutions that collect and make accessible sounds and images.

YouTube as Archive or Library

In another article from the *Video Vortex Reader* Thomas Thiel discusses an installation by Wilhelm Sasnal consisting of a 16mm loop projection showing various video clips filmed from the screen of a laptop presenting “the historic and diverse contents of the media archive

YouTube.”² Referring to a video-sharing website as an archive of highlights, on the one hand, the fact that among the millions of clips that can be found there, a non-negligible number present, and thus make accessible, historic material. Such a point of view is perfectly illustrated by a post on the *McGill Tribune* website by someone called Bryant, who states: “Now YouTube is an archive; just the other day I watched an educational film that was made in the 1950’s, that, without youtube I would’ve never seen.”³ On the other hand, the archive analogy stresses the possibility that users can find material there and reuse it for their own purposes, as is the case with Sasnal’s installation mentioned above. Similarly, Henry Jenkins declares that “YouTube functions as a media archive where amateur curators scan the media environment, searching for meaningful content, and bringing them to a larger public (through legal and illegal means).”⁴ The term “archive” is used in both cases in a rather straightforward way, pointing towards a collection of audiovisual material that is stored and can be retrieved through appropriate search operations, rather than, for instance, in the more epistemological sense in which Foucault uses it.⁵ Here, the term “archive” is furthermore associated with the general possibility of storing data collections and does not refer to the traditional understanding of archiving as an institutionalized practice. Online data collections labeled archives could in fact be better characterized as perpetual transmission rather than permanent storage. Some moving-image archivists, therefore, clearly reject the analogy because of at least one fundamental difference emphasized by Leo Enticknap:

I don’t see any evidence that YouTube is attempting to undertake long-term preservation of any of the material it hosts, which is surely a core function of an archive; one which distinguishes an archive from other types of document or media collection. Indeed, it’ll be interesting to see what happens to the less frequently viewed content once YouTube’s server capacity is filled. As far as I can see, YouTube is essentially an infrastructure for the distribution of video content for end user viewing.⁶

Enticknap marks a decisive difference here, indeed: questions of preservation do not play any kind of role on such a video-sharing website, and neither does the question of precisely identifying the status of a document, or the issue of different versions of a film, its registration

and cataloguing according to certain standards, etcetera. This leads Rick Prelinger to conceive of YouTube rather as a library: “Actually, I think your description of what YouTube does shows that it’s more of a library than an archive. I understand the difference to be that an archive (‘archos’—‘first’) is charged with the permanent preservation of original documents, whereas a library simply exists to make copies available for access.”⁷ But this proposition, too, is rejected by a different AMIA (Association of Moving Image Archives) member, Andrea Leigh, because of yet another important aspect that is lacking on YouTube, namely rules and regulations, that is ethics, with regard to the material aspects of a document that govern the work of archivists and librarians alike. “Libraries are oriented around a code of ethics [...] and a core set of values,” she writes. These provide “communities with comprehensive access to both information and entertainment resources, not entertainment resources only that lack selection criteria, principled organizational methods based on over 100 years of practice and tradition, and a high service orientation. So not only is YouTube not an archive, it is not a library, either.”⁸

While such debates might be seen as traditional archives setting up defense lines against new practices and especially new organizational forms appearing on the Internet, there are also obvious differences between both as regards goals, procedures and ethical commitments. And there are obvious differences between Web-based projects as well, for instance between archive.org and YouTube. But clearly, archives and libraries are institutions that function according to relatively strictly codified lines of conduct, that have to observe standards defined by professional associations, often on an international level. More importantly for our analysis here, however, what this discussion shows is that whatever analogy is drawn to existing institutions or functions (this might even be valid for the more neutral term “repository” that is also used regularly to describe YouTube) will fall short on one level or another, only partly covering the rather specific way in which such a video-sharing facility functions.⁹ It may thus, indeed, be more productive to let go of such comparisons and start with the technological foundations of the platform, that is, as suggested by Geert Lovink, its being a database.

YouTube as Database

Lev Manovich has identified the database as a crucial aspect of digital media as such. Going beyond the computer sciences' definition of the database as a structured collection of data, Manovich considers it a cultural form that follows its own logic and exceeds operations such as the storage and retrieval of data. "They appear as a collection of items on which the user can perform various operations—view, navigate, search."¹⁰ In addition to this, YouTube, as well as other services generally referred to as Web 2.0, offers the possibility of adding items to databases, improving the information management through user-generated meta-information as well as synchronizing them through so-called Application Programming Interfaces (API).¹¹ In this respect, YouTube as a database is in fact more accurately described as an infrastructure, as its scope goes well beyond the YouTube Internet site proper. The website "The programmable web" lists more than 330 so-called mashup sites employing video feeds and other data from YouTube. These facilities make accessible specific selections from the YouTube database that YouTube itself does not offer its users, sometimes combining them with other Web applications such as, for instance, Google Maps, Flickr, and also other video-sharing sites or music distribution services such as LastFM.



40 "Kutiman mixes YouTube": funky mashup site

Another option YouTube offers are the so-called "embedded links" that facilitate integration of YouTube videos into all types of other environments, from personal websites and amateur or professional blogs

to the online services of traditional media such as newspapers, magazines and television channels. YouTube even explicitly encourages such embeddings, as is evidenced by the proposed links to several other Web 2.0 platforms.¹² The YouTube database, in other words, is accessible not only through the one interface that Google manages itself. While surfing the Internet, a user can encounter moving images branded with the company's logo almost anywhere. When a video has been watched through an embedded link, the viewer is offered the possibility of looking at so-called related material, too. The user can thus navigate the database from an external site also, albeit with fewer options.

The YouTube database, however, does not only consist of video files, but also contains titles, brief descriptions called "info," tags, hyperlinks to the uploader's site or to related material, as well as user comments of variable, and sometimes quite extensive, proportions. In addition, it stores data concerning the number of views, popularity ratings, flagging rates, recursive links and other kinds of statistical information. In fact, video retrieval and management depend fundamentally upon such user-generated input provided as text. Since moving-image files are not machine-readable—meaning that the program cannot identify the semantic content of this kind of file—information management relies on metadata that names, describes or categorizes whatever there is to be seen. This is an essentially hybrid constellation, since users provide semantic input, which the machine then processes algorithmically, producing different types of clustering with a corresponding organization of video files and metadata.¹³ Ultimately, this technological infrastructure can be seen as a specific affordance enabling new forms of media practice. In a way, thus, understanding YouTube means describing it in terms of a "hybrid interaction" where humans and machines—users and information management systems—are inextricably linked.

One could also refer to the approach formulated by the so-called Actor-Network theory, according to which human and non-human actors have to be considered equally important in the constitution of social interaction.¹⁴ As the way in which YouTube and other Web 2.0 applications such as Flickr, Facebook and other function depends fundamentally on the way in which they succeed in channeling user activities into software design, one could describe them in terms of what Tim O'Reilly addressed as "architecture of participation," which is also in a way akin to Bruno Latour's analyses of translations of social protocols

into technological design.¹⁵ Consequently, Web 2.0 applications thrive on stimulating user participation on various levels, which subsequently is translated into input feeding the information management system.

YouTubing: View, Navigate & Search

Doing YouTube can mean a number of things: one can simply watch one (specific) or a whole series of clips; one can rate, flag or comment on videos; or one can upload, categorize, annotate and tag one's own moving images (either self-produced or found and appropriated). These operations imply different levels of activity on the part of the user, but even a simple viewing (either on the YouTube site or embedded somewhere else) leads to an invitation, or proposition, to watch more. Right from the start, the YouTube interface offers various choices. In addition to the search facility it shows which videos are being played at that very moment, it presents a number of "promoted videos" (proposed by the YouTube company) as well as "featured videos" that are highlighted for their qualities (having been selected for this category is one of the "honors" subsequently flaunted among the "Statistics & Data" information for the clip).

Viewing, in other words, is but a default aspect of navigation. The act of watching YouTube is in such a perspective only the practice of navigating through the database's content, exactly as claimed by Lovink. This, however, differs fundamentally from the activity of zapping from channel to channel on a traditional TV set, since the various television programs are not linked to each other by any semantic relations, and are simply related by the fact of their being broadcast simultaneously. The YouTube suggestions do not really compare to the program structures of early cinema, either. Thematically organized programs would also present some kind of overarching narrative, whereas the dominant format would present some sort of structured variety.¹⁶ By contrast, viewing YouTube actually consists of navigating from one video to another, semantically related ones. This practice is not confined to the Youtube.com domain, but has been implemented into many other Web services and websites by means of open APIs that allow users to stream contents from the YouTube database into different applications, and where every viewing leads to a list of related clips.

In order to search the database for video clips, the YouTube interface, to begin with, includes a common search bar. However, the API also offers the possibility to automate search processes and retrieve videos according to a certain search string in order to implement them into a different application.¹⁷ As mentioned, YouTube's information management relies on machine-readable information describing the video clips that permits their retrieval according to key terms. A video clip of Madonna, in other words, can only be recognized as such when there is an explicit textual marker. This so-called meta-information is initially generated by the users uploading the videos and consists of the title users give a clip, the information added to an info box in order to provide background information or a summary of the clip, and the tags, that is a number of keywords one can select freely according to what one assumes to be appropriate labels for these images. Users viewing videos also provide meta-information implicitly, since the viewing rate is a criterion for the order of videos that match a given keyword.¹⁸ The activities of users, either those supplying information about videos they upload in the form of a title, additional information and tags, or those viewing, rating, commenting on or flagging videos, do affect the responses of YouTube to search requests. Navigating the YouTube database is therefore also intrinsically related to the activities of the numerous other users providing the necessary meta-information for efficient information management. Furthermore, a specific media practice emerges here, where users create meta-information in order to receive more views of the material they have uploaded, and by the same token they improve information retrieval processes within the database. Meta-information, in other words, is crucial for the information management on Web platforms that host non-machine-readable content such as videos or images. In order to function, YouTube, and also Flickr and other services of that type, in fact "crowdsource" the labor that is necessary to supply the meta-information, benefiting from the various ways in which users willingly or unwillingly, explicitly or implicitly provide them with input.

The success of searching moving-image files thus relies upon the different types of metadata provided by the person who uploads a clip as well as by other users. Search results consist of a selection of videos that match the request in a presumed order of relevance, but may in fact not include the item one has looked for. Users can then either renew the search or click on one of the suggested clips in the hope that the

“related videos” listings will get them closer to their goal. These kinds of operations would be utterly inefficient for a traditional moving-image archive where search criteria are defined as precisely as possible, where categories and keywords are fixed in thesauri, often as a result of cross-institutional or even international agreements, and where catalogues contain similar information for each item.¹⁹ In other words, the kind of metadata produced and used by archival institutions aim for maximum clarity and efficiency, whereas the search-as-navigation procedures characteristic of YouTube and similar platforms derive from a form of media practice that follows a different rationale.

Creating YouTube: Upload, Tag, Comment and Flag

YouTubing in many ways goes beyond the activity of merely watching videos. The interface at the youtube.com site already offers many possibilities for users to partake of its functioning. The ensuing activities can be divided into operations resulting in either explicit or implicit participation. Users participate explicitly by, for instance, starting a channel and uploading videos to the database. This activity includes the creation of meta-information and addition of title, tags, and other information to the uploaded video clip. Users watching those clips can either react to them by posting a video response or commenting on them in writing. Both forms of comments will be intrinsically related to the initial video, but may also offer additional possibilities for navigating to other user sites and videos. When uploading a video, users are requested by the YouTube interface to select a category that fits the video clip.²⁰ Since these rather broad categories do not sufficiently describe the video clips to allow efficient search operations, users can additionally add tags to formulate more specific categorization of their content.²¹

The choice of tags is supposed to be related to what the images present, but the meta-information can also be employed strategically for other reasons. Obviously, YouTube can be used in many different ways. As indicated above, it can serve as some sort of repository, enabling users for instance to copy and upload material from TV and add them to an existing, rather incoherent collection of memorable televisual moments, featuring incidents from TV shows such as *The Jerry Springer Show*, *Idols*, *The Colbert Report*, *Late Show with David Letterman*,

etcetera. Here, YouTube constitutes something like a dense compilation of television highlights. Tags refer to the title of the TV program as well as to the noteworthy aspect of the fragment in question (e.g. such as Jerry Springer, bizarre, cheater). Another function YouTube fulfills is serving as a channel to explain the way in which one must proceed in order to achieve a given result. This takes the form of videos illustrating various do-it-yourself practices. Such files are then associated with the How-to category, but additionally tags refer to the practice in question and even to related issues (e.g. Little Brother book, How to make a shirt print). Yet another way of using YouTube has been labeled self-presentation.²² Often such videos provoke or explicitly ask for video responses, which constitute an additional set of video comments on the original video. This area of self-presentation could also be understood as some kind of commentary users make on popular culture or political trends.



41 Tagging as misinformation

For political reasons especially, tags are often chosen with the strategic goal of luring others to view a given video file. In such cases the practice of tagging is in a way appropriated and turned into a form of deliberate misinformation. The clip entitled “XXX PORN XXX” by user AbolishTheSenateOrg, for instance, is tagged with a variety of keywords that can refer to pornography, while the video itself is a plea to abolish the US Senate. User scottstone567 tries to attract views by adding

pornography-related tags, title and info to videos that display instances of rather unskilled painting and related activities. It appears that the use of tags, title and description is actually quite frequently appropriated in order to increase the number of views for such videos, which show content that does not at all correspond to what the metadata suggest. Referring to complaints about this practice, user Redsoul76 comments in the info box of his video "Paris Hilton new Sex Video": "RoflMonkeys-Copter stop complaining and searching for porn on youtube and next blame for not finding it lol..."²³

Users take ample advantage of the option to comment on uploaded material. In some cases, and not always in direct proportion to the number of views, clips may provoke tens of thousands of reactions. Sometimes mere statements of approval or disapproval (in many cases just a simple "lol" or "wtf"), there also are strings of discussions among users, which by the way do not always involve the content of the clip in question. In some cases, it is an aspect of a comment that leads to a reaction and discussions of an entirely unrelated issue. In practice, probably but relatively few viewers will read through all these comments, especially if there are thousands of them. However, the commentary section is an integral part of the database and generates metadata that are relevant to the overall functioning of YouTube, even though the content of individual comments may be of interest to the commentator only. As for the generation of metadata, the number of comments feeds into indications of popularity and relevance. When searching for a video, the search engine seems to favor those that have obtained high numbers of views and also received many comments.²⁴

YouTube also offers the possibility for a very specific type of user comment, namely the so-called flag button for "report[ing the] video as inappropriate." While making such an option available to users may originally have been inspired by the idea that this might help the efficient and rapid removal of pornographic, racist or otherwise extremist content from the site, it can also lead to various forms of censorship when people declare that they feel "offended" by a clip, for whatever reason. As the YouTube staff has the final authority in this question without having to argue about or justify such decisions, there are some concerns about hidden forms of censorship resulting from abusive flagging.²⁵

All these operations that YouTube offers its users—or rather which must be used for YouTube to generate the metadata necessary for its functioning—are at first sight ancillary options and additional services. Quite on the contrary, however, they actually provide the indispensable basis for the database's information management. In part, this requires acts of deliberate participation—uploading, tagging, commenting, flagging—where users choose to actively contribute to the YouTube website. But in addition to such actions, which one could label "explicit participation," any such operation is also a contribution to the database, even though the latter aspect may be for users just a side effect of what they consider their main purpose, namely to interact directly or indirectly with others. In fact, every single click on one of the links to a clip, however random or accidental this choice may be, does feed into the database as well. Every interaction with the YouTube site leads to a trace in the system and becomes a record relevant to the statistics that can be read at the surface as an indicator for "popularity." Such acts of "implicit participation," of which most users are probably unaware, are actually the backbone of the entire operation. The participation, in other words, is implemented into the software design.²⁶

YouTube as Resource: Mashups and Spin-off Services

Given the enormous amount of uploaded video clips as well as the specific software design, YouTube functions in many respects as an infrastructure and cultural resource. This is the case for the artists or other users for whom, according to Henry Jenkins and Thomas Thiel, YouTube functions as an archive, that is as a reservoir of material they can appropriate and reuse according to their own needs. But in addition, as Tim O'Reilly points out, it is crucial for Web-based services to provide synchronizable databases in order to have their service implemented in as many third-party applications as possible. The activities that we have labeled "Creating YouTube" in fact also include the implementation of the contents of its database into other Web applications. The YouTube API is frequently used for building so-called mashup websites. This term designates sites that "mash" various data streams from different Web applications together to create a new format.²⁷

Mashups such as Tagbulb use APIs of various Web services such as YouTube, Yahoo Video, Flickr, Google, del.icio.us and others in order to present related content from those different sources, or in this case resources, corresponding to a given key term.²⁸ Mashups, in other words, make available combinations of material from various services organized according to specific zones of interest in ways that the original platforms do not provide. Reversing, in a certain sense, commercial enterprises' practice of opening their own channels on YouTube as an additional distribution outlet, mashup websites comb through all sorts of collections of material and make selections targeted towards relatively well-defined groups of users.

The continuous circulation of YouTube material, together with the aforementioned fact that identification of particular clips depends on the meta-information added by uploaders and other uses, results in the fact that the database can be described as a repository for audiovisual material that is simultaneously stable and unstable. Instability results, to begin with, from the rather incoherent and unorganized way in which videos are indexed, labeled and filed. But at the same time, and in fact by the same token, stability is generated through the organization of content in the form of a dense layer of meta-information consisting of titles, tags and descriptions. Another factor characterizing YouTube as an unstable repository is the uncertainty as to whether or not uploaded videos remain on YouTube. Any video may disappear from the site for a variety of reasons: material can be removed by the person who posted it originally, or it can be deleted by YouTube staff members for violating the terms of use. But popular videos that have been removed often reappear, either on YouTube or other video-sharing platforms. Here an unorganized, rather anarchic and accidental practice of users copying and re-uploading videos results in redundant storage.²⁹ This practice creates at least some kind of stability countering the unstable nature of digital repositories. The inherent instability, in other words, seems to stimulate practices for compensation. One example here is the MIT project YouTomb, which monitors videos uploaded to YouTube and identifies those that have been removed for violating terms of use.³⁰ YouTube is therefore more than a mere Web platform where videos can be uploaded and viewed. Rather, it seems to be an infrastructure and a cultural resource that can be used in numerous ways. It constitutes the raw material for a new media practice of perpetual uploading, viewing

and deleting of material, as well as streaming it to a variety of other Web services and sites.

Conclusion: YouTube as a New Media Practice

While Geert Lovink clearly identifies a central and crucial point of the phenomenon YouTube when he claims that "we no longer watch film or TV; we watch databases," this statement in a way short circuits the basic infrastructure of YouTube and the variety of ways in which it functions for its users, both at its surface and even beyond, as is the case with mashup sites and the embedding of clips within other sites. As we have tried to show in this article, YouTube constitutes an intrinsically hybrid system of information management, where users provide all sorts of input, among which the uploading of audiovisual material most certainly is the site's *raison d'être*. However, making video clips available to others is not sufficient for YouTube to operate. The material has to be described, indexed and categorized in various ways in order to be storable, identifiable, retrievable and thus viewable or, in a literal sense, to become *visible*. Once made visible in this emphatic sense, thanks to the software design a clip becomes related to other videos, ranked in terms of its relative popularity according to the number of views, and it may even become a "featured video" because of whatever qualities have been ascribed to it; others comment on it; it may trigger approval, disapproval or debates; it may also get flagged and consequently removed for being judged inappropriate.

While description, indexing and categorization are standard operating procedure for traditional archives—albeit in a different and more systematic and normative way—the different acts of explicit and implicit participation, the generation of metadata by various kinds of user activities constitute a new media practice that represents a challenge to our established conceptions of media use. In order to analyze a phenomenon such as YouTube, one needs to take into account its fundamental heterogeneity and hybridity, its technological infrastructure as well as what is happening on its surface or its interface. The multifunctional interfaces of YouTube, providing numerous possibilities of use and reuse, form a perpetual stream of data that goes well beyond the YouTube Web platform and appears in a multitude of other websites and

services. Using YouTube is a practice of navigating through the database of stored contents, either by direct search requests on the YouTube website, or by clicking through lists of videos provided on YouTube or any other website that streams videos from its database. The hybrid information management is crucial, as it determines the retrieval and the relational presentation of videos. Apparently, users quickly learned how to affect search results through keywords (tags) and additional text-based information. The versatility visible in the technical design meets the miscellaneous practices to make YouTube a platform and a channel for “shameless” self-representation, but also educational videos, political propaganda, informative documentaries and commercial programs, as well as grassroots journalism, alternative news services and political debate. Hence, YouTube obviously provides a platform for viewing all sorts of audiovisual clips, but also a forum for various kinds of interaction between humans, and perhaps even more importantly, an infrastructure for generating data that can be treated as metadata. To understand YouTube, one needs to go deep into YouTube.

Endnotes

- * The authors would like to thank the members of the Utrecht Media and Performance Seminar for their valuable comments on an earlier version of this text.
- 1 Geert Lovink, “The Art of Watching Databases. Introduction to the Video Vortex Reader,” in *The Video Vortex Reader. Responses to YouTube*, eds. Geert Lovink & Sabine Niederer (Amsterdam: Institute of Network Cultures, 2008), p. 9.
- 2 Thomas Thiel, “Curator as Filter/User as Creator,” in *The Video Vortex Reader*, p. 184.
- 3 Post by Bryant dated 1 July 2008 – www.mcgilltribune.com/home/index.cfm?event=displayArticleComments&ustory [last checked 15 February 2009].
- 4 Henry Jenkins, *Convergence Culture. Where Old and New Media Collide* (New York: New York University Press, 2008), p. 275.
- 5 See Michel Foucault, *L'archéologie du savoir* (Paris: Gallimard, 1969), pp. 169–173. See also Wolfgang Ernst, *Das Rumoren der Archive* (Berlin: Merve, 2002).

- 6 Post by Leo Enticknap on the Association of Moving Image Archivists (AMIA) discussion list, “The YouTube issue” thread – <http://palimpsest.stanford.edu/byform/mailling-lists/amia-l/2006/10/msg00274.html> [last checked 15 February 2009].
- 7 Post by Rick Prelinger, *ibid.*
- 8 Post by Andrea Leigh, *ibid.* This position, however is nuanced by another librarian: “A library is simply a collection of materials made for use by a particular population—that’s the dictionary definition. [...] Does YouTube hold a collection of materials? Yes. Do they provide comprehensive access? Yes (to those who have computers). Is there any organization? Probably very little, but I haven’t spent enough time on there to figure that out. Do they have selection criteria? No I don’t think so, but in this case it makes it all the more interesting ... which is the objective I believe. The point is ... I think there is definitely strong argument that it is not an archive ... but not a library? Hmmm.” Post by Brena Smith, *ibid.*
- 9 For YouTube itself, however, such analogies are rather profitable in terms of its cultural legitimation. Hence the comment of one AMIA member: “I’m sure Google would be thrilled to know that professionals are spending their days discussing whether or not YouTube is an archive, library, or neither. \$1.65 billion well spent. Ha ha!” Post by Brena Smith, *ibid.*
- 10 Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2001), p. 219.
- 11 See Tim O’Reilly, “What is Web 2.0” (2005) – www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html [last checked 15 February 2009].
- 12 YouTube and other video websites stream their videos in the Adobe flash video format. Various additional applications, so called add-ons, for the frequently used Mozilla Firefox Browser enable downloading video clips and saving them as flv files—on a Mac you simply press Command-Option-A and then save the flv file. Videos downloaded from YouTube thus constitute an “unknown” data collection that is extending the YouTube database into the hard drives of a multitude of users, where videos might be stored even long after their removal from the YouTube database itself.

- 13 Among others, these metadata offers the possibility of placing advertisements that correspond to the content of a clip and thus generate additional income for YouTube's mother company Google.
- 14 See Bruno Latour, *Reassembling the Social. An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005).
- 15 See Bruno Latour, "Technology is Society Made Durable," in *A Sociology of Monsters. Essays on Power, Technology and Domination*, ed. John Law (London: Routledge, 1991).
- 16 See contributions to *KINtop. Jahrbuch zur Erforschung des frühen Films 11. Kinematographen-Programme*, eds. Frank Kessler, Sabine Lenk & Martin Loiperdinger (Frankfurt am Main: Stroemfeld Verlag, 2003).
- 17 This also goes for the already mentioned so-called mashup websites "mixing" content from YouTube with other databases or streaming selected videos into an interface different from the YouTube interface.
- 18 The ranking of videos provided as results for any given search request are also affected by the popularity of the video, ranking more popular videos higher. As Ann-Sophie Lehman has pointed out in her review of the category of How-to videos on YouTube, the search phrase "How to iron a shirt" retrieves a list of videos showing how to iron a shirt, but also ranked within the top five results the video "Hillary Heckled Iron My Shirt" of an incident during the Hillary Clinton campaign. The video has had a high number of viewers, the title contains the keywords "iron" and "shirt," which in combination with the high viewing rate (99,313 views as of January 2009) and a high number of comments (988 as of January 2009) probably identified it as a video relevant to the search request "How to iron a shirt." See also Ann-Sophie Lehmann, "How to YouTube. Aneignung und Repräsentation kreativer Prozesse als Performanz von tacit knowledge" (unpublished paper presented at Jahrestagung der Gesellschaft für Medienwissenschaft 2008, Bochum).
- 19 See for instance Harriet W. Harrison, ed., *The FIAF Cataloguing Rules for Film Archives* (Munich: Saur, 1991).
- 20 YouTube makes users choose between the following fifteen categories: Cars & Vehicles, Comedy, Education, Entertainment, Film & Animation, Gaming, How-to & Style, Music, News & Politics, Non-profits & Activism, People & Blogs, Pets & Animals, Science & Technology, Sport, Travel & Events. While there most certainly is some kind of logic behind this, the categories definitely read as a rather random attempt to create classifications.

- 21 Frequently used tags are keywords such as video, sexy, sex, music, rock, rap, funny, news, pop, dance, film, short, and TV. The majority of the uploaded videos are categorized as Music, Entertainment, People / Blogs, and Comedy. See a survey on the most recent uploaded videos of March 12, 2007, conducted by Michael Wesch at Kansas State University – <http://ksudigg.wetpaint.com/page/YouTube+Statistics> [last checked 15 February 2009].
- 22 See for instance Birgit Richard, "Media Masters and Grassroot Art 2.0 on YouTube," *The Video Vortex Reader*, pp. 145–146.
- 23 The video does not display any pornographic content but non-nude pictures of Paris Hilton and footage of monkeys. It is tagged "Hot, XXX, Adult, Action!, Extended, version, real, though including, paris, hilton, and, pamel, anderson, sex, tape, clips, uncensored" – <http://nl.youtube.com/watch?v=u8rkZxfoZNA> [last checked 15 February 2009].
- 24 For a quantitative study on the construction of popularity on YouTube videos and the way this is carried out by the information management system see Meeyoung Cha et al., "I Tube, You Tube, Everybody Tubes: Analyzing the World's Largest User Generated Content Video System," in *Proceedings of IMC 2007* (San Diego: ACM Internet Measurement Conference, 2007), pp. 1–14.
- 25 With regard to censorship concerns regarding material relating to homosexuality, see Minke Kampman, "Flagging or Fagging. (Self-)Censorship of Gay Content on YouTube," *The Video Vortex Reader*, pp. 153–160.
- 26 For a discussion of this and similar phenomena as aspects of an "extended cultural industry," see Mirko Tobias Schäfer, *Bastard Culture! User Participation and the Extension of Cultural Industries* (PhD diss., Utrecht University, 2008).
- 27 At the time this article was written in December 2008, the website The Programmable Web lists 334 mashups for the YouTube API – www.programmableweb.com/api/youtube [last checked 15 February 2009].
- 28 See Tagbulb – www.tagbulb.com/ [last checked 15 February 2009].
- 29 This, however, has side effects with regard to the automatic ranking by the information management system. As several identical clips can be uploaded and they are considered separate, the popularity status of the same video may vary considerably. See Meeyoung Cha et al. 2007, p. 13.
- 30 See YouTomb – <http://youtomb.mit.edu/> [last checked 15 February 2009].